

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 29 MAY 2004 (29.05.2004)

Applicant's or agent's file reference
PH-21532-PCT

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/KR2004/000374

International filing date (day/month/year)
24 FEBRUARY 2004 (24.02.2004)

Priority date (day/month/year)
09 JUNE 2003 (09.06.2003)

International Patent Classification (IPC) or both national classification and IPC
IPC7 H01L 33/00

Applicant

POSTECH FOUNDATION et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/000374

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2004/000374

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------------|-----|
| Novelty (N) | Claims | 1-15 | YES |
| | Claims | NONE | NO |
| Inventive step (IS) | Claims | 7-8, 14-15 | YES |
| | Claims | 1-6, 9-13 | NO |
| Industrial applicability (IA) | Claims | 1-15 | YES |
| | Claims | NONE | NO |

2. Citations and explanations :

The documents cited in the International Search Report:

D1 : KR 2003-85272 A

D2 : JP 2003-73859 A

D3 : WO 94/00885 A1

D4 : JP 2003-45661 A

D5 : JP 2000-31462 A

The subject-matter of Claims 1-6 and 9-13 lacks an inventive step under PCT Article 33(3).

The subject-matter of Claims 1-6 and 9-13 is a contacts fabric invention using heterostructures of metal/semiconductor nanorods and a manufacturing method thereof. Heterostructures are produced by the method comprising the following steps: depositing metal on the nano-material that is grown on a substrate orthogonally or unidirectionally; and the nano-material is selected from the group consisting of ZnO, GaN, Si and InP, and the metal is selected from the group consisting of Au, Cu, Pt, Al, Mn, Fe, Co, Ni and an alloy thereof.

D2 discloses a regularly arranged nano-structure joined on the substrate and a manufacturing method thereof. The substance forming the nano-structure can be a compound, which develops photocatalyst characteristics when absorbing at least ultraviolet radiation or the ultra-violet of sun light, such as TiO₂ or ZnO. The regularly arranged nano-structure is obtained on the substrate, which has a morphology such as nanotube, nanodot, nano drill rod, nano fiber, and nano wire.

D3 discloses a light emitting device incorporating a layer of porous silicon of low dimensionality surmounted by a discontinuous layer of silver in the form of discrete islands. A digitated electrode is connected to the islands, and the islands have diameters in the range 5 nm to 20 nm and spacings in the range 10 nm to 50 nm. They form a Schottky diode structure on the silicon.

Therefore, the features of Claims 1-6 and 9-13 are already disclosed in D2 and D3 in a similar field of application, or are included among several straightforward possibilities or combinations from which the skilled person could select without the exercise of inventive skill.

Although D1 discloses all the features of Claims 1-6 and 9-13, D1 is published later than the priority date claimed in this application.

The subject matter of Claims 1-15 is considered to be industrially applicable.